Automatic Power-Off

030

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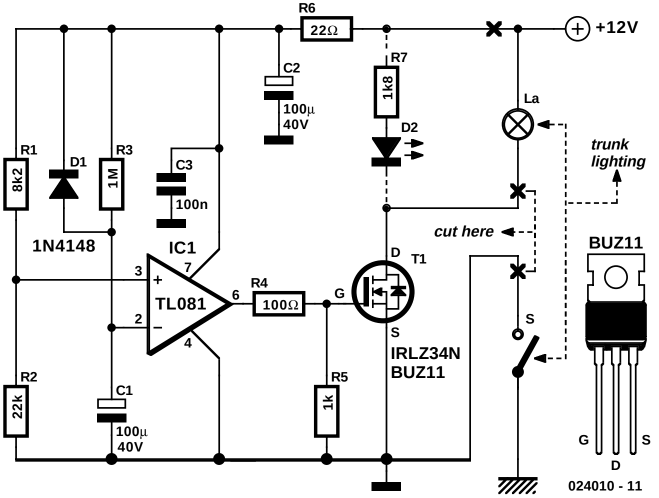
This circuit represents a general-purpose automatic shut-off switch. The author uses it in his car to ensure that any lamp left on by accident (boot lamp, interior lamp etc.) does not drain the battery while the car is parked in the garage for a few days. Of course, it can also be used in a large variety of other applications.

The operating principle is both simple and effective. The operational amplifier is wired as a comparator. A fixed voltage equal to approximately three quarters of the supply voltage is applied to one input. On the inverting input, the voltage is zero when the circuit is switched on, and it rises slowly as C1 charges via R3. The opamp output is thus High. If the voltage reaches the value determined by voltage divider R1/R2, the comparator output switches to Low. With the given component values, this occurs after approximately 100 seconds.

The comparator drives an n-channel MOSFET (BUZ31 or IRLZ34N). This transistor conducts when its gate is High, and it interrupts the lamp circuit when the comparator output switches to Low.



Assuming that S is the boot lamp switch in the car, it is open when the boot is closed. The circuit is then without supply voltage and C1 quickly discharges via D1. Note that the circuit may only be connected to the car chassis via S. When the boot is opened, S is closed causing the circuit to be powered and lamp La to light. The LED will also light, indicating correct operation of the circuit. After the above mentioned delay, the lamp goes out again and the current consumption of the circuit is reduced to about 3 mA, which represents a negligible load on the car battery.

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